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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,333	02/07/2002	Yoshiyuki Hirayama	HITA.0161	4593

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EXAMINER

RICKMAN, HOLLY C

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/067,333

Applicant(s)

HIRAYAMA ET AL.

Examiner

Holly Rickman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2,4-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 1 is objected to because of the following informalities: the word "includes" is misspelled in line 8. Appropriate correction is required.
2. Claims 4 and 6-7 are objected to because of the following informalities: these claims depend directly or indirectly from cancelled claim 3. For purposes of examination, it has been assumed that the claims depend directly from claim 1 in the case of claims 4 and 6. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The rejections of claim 11 under 35 USC 112, first paragraph and second paragraph are withdrawn in view of the cancellation of the claim.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
5. The rejection of claims 3 and 11 under 35 U.S.C. 103(a) as being unpatentable over

Girt et al. (US 6645614) are withdrawn in view of Applicant's amendments.

6. Claims 1-2, 5-6, and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Girt et al. (US 6645614) and Doerner et al. (US 6537684).

Girt et al. disclose a magnetic recording medium having an underlayer of Cr or a Cr alloy formed on a NiP-plated substrate, a first ferromagnetic layer, a Ru intermediate layer, and a second ferromagnetic layer formed thereon. The magnetic layers are antiferromagnetically coupled across the Ru layer having a thickness of 0.8 nm (col. 7, line 24 to col. 8, line 22). The reference teaches that the ferromagnetic layers are formed from CoCrPt (col. 3, line 65 to col. 4, line 6). The reference gives an example wherein the amount of Pt present in the CoCrPt is 10 atomic percent but states that antiferromagnetic coupling decreases with an increase in the amount of Pt as illustrated using examples with 0 at% Pt and 10 at% Pt.

Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to determine the optimal concentration of Pt in the CoCrPt magnetic layers in order to provide maximum antiferromagnetic coupling between magnetic layers. Such an optimization would have been obvious because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Furthermore, Girt fails to teach the use of a CrTi underlayer directly in contact with the first magnetic layer. Instead, the reference teaches the use of a Cr alloy directly in contact with the first magnetic layer.

Doerner et al. teach the use of Cr alloys including CrTi directly underneath the first CoCr based magnetic layer in an antiferromagnetically coupled recording structure (see col. 3, lines 29-33).

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute CrTi for the broadly disclosed "Cr alloy" layer taught by Girt et al. in view of the functional equivalence of the two materials.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Girt et al. (US 6645614) in view of Doerner et al. (US 6537684), as applied above, and further in view of Wang et al. (US 2002/0098389).

The combination of Girt et al. and Doerner et al. teaches all of the limitations of the claim, as detailed above, except for the use of CrTiB underlayer in place of the CrTi layer taught therein.

Wang et al. teach the equivalence of CrTi and CrTiB for use as underlayers in magnetic recording media underneath Co alloy layers (see claim 5).

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute CrTiB for the CrTi layer taught by the combination of Girt et al. and Doerner et al. in view of the functional equivalence of the two materials.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Girt et al. (US 6645614) in view of Doerner et al. (US 6537684), as applied above, and further in view of Sakawaki et al. (US 2002/0160234).

The combination of Girt et al. in view of Doerner et al. teaches all of the limitations of the claim, as detailed above, except for the use of an amorphous film containing Ta and Ni formed between the substrate and the CrTi layer.

Sakawaki et al. teach the use of NiTa as an orientation determining layer under a Cr-based underlayer wherein the NiTa layer causes the Cr underlayer to have predominant orientation plane of (200) plane thus allowing the overlying magnetic layers to have a (110) orientation (paragraphs [0031]-[0038]).

It would have been obvious to one of ordinary skill in the art at the time of invention to add a NiTa layer underneath the CrTi layer taught by Girt et al. in order to provide the recording medium with the preferred (200) orientation for the underlayer and the preferred (110) orientation for the magnetic layers.

#### ***Response to Arguments***

9. Applicant's arguments filed 9/20/04 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Holly Rickman  
Primary Examiner  
Art Unit 1773

November 26, 2004